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**UNIVERSITY OF ALBERTA
COLLEGE OF AGRICULTURE**

**Marketing Alberta Feeds By The
Cattle Finishing Route**

BY

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SUMMARY

1. Alberta grown feeds are suitable for finishing cattle.
2. An abundant supply of feed, provision for water, comfortable quarters and attention to details are important factors in successful cattle feeding.
3. Two-year-olds, full fed, will consume approximately one and one-quarter to one and one-half tons of hay, and thirteen hundred to fourteen hundred pounds of grain during the finishing period. Younger animals will take somewhat less.
4. It will require approximately a four month feeding period to finish two-year-old animals when full fed grain. Yearlings will take a month longer, while calves will require two months longer.
5. In years of low feed prices, proper finishing is to be recommended.
6. For the inexperienced feeder, yearlings might be an advantage over either calves or two-year-olds.
7. Under certain conditions heifers, provided they are not in calf, may equal steers as profitable feeders.
8. The question of "margin" or spread between buying and selling price is one of the most important factors in determining profits in cattle feeding. This suggests the importance of buying on a favorable market and if possible selling when cattle prices are strong.
9. Polled, or dehorned animals are a better prospect as feeders than those with horns.

Marketing Alberta Feeds By The Cattle Finishing Route

In view of the large volume of coarse feed available on many farms in certain sections of Alberta, together with the relatively low cash price of all farm-grown crops this year, the question of the most profitable means of disposing of these crops is one that is of considerable concern to not a few farmers in the Province.

The purpose of this publication is to discuss the place that the winter finishing of cattle might occupy in the general program for the marketing of farm crops at this particular time.

During the past twelve years, a rather extensive program of cattle finishing experiments has been in progress at the University of Alberta, and the information and suggestions that will be presented are based largely on the results obtained from these trials.

The business of finishing cattle, in common with any other farm enterprise, has its periods of "ups and downs." One could point to certain years where owing to a combination of circumstances such as high feed prices, together with a low spread between the value of the animals when put into the feed lots as compared with the selling price when finished, there was either a very small return or even an actual loss. On the other hand, there are, too, other times when conditions are much more favorable with the result that the feeder has received a somewhat higher price for the feed consumed than could have been obtained had it been marketed direct for cash. This suggests that it is only when one considers the returns secured from disposing of feed through finishing beef over a reasonable number of years is it possible to arrive at anything definite with respect to what this particular phase of livestock feeding might offer.

Complete records, covering a ten-year period (1920 to 1929 inclusive) during which time several hundred feeder cattle were finished in the feed lots at this institution, are now available and offer an interesting study to anyone who may at this time be contemplating embarking in the business of feeding

cattle this coming winter. The price of both feed and cattle during this period varied from year to year. The price of grain varied from one and one-half cents, or more, per pound, to a low of considerably less than one cent per pound. Feeder cattle prices ran from \$3.25 per hundred pounds to \$8.50 per hundred pounds. There was also a wide range in the "margin" or spread between the feeder cattle when entering the feed lots in October and November, and the selling price when offered as finished animals the following spring. During the period under review, the margin varied from \$3.11 per hundred pounds in 1921-22, to as low as 43c in 1928-29.

Having regard to what has been said with respect to the wide variations in those factors which determine the returns secured from the cattle finishing business, namely, feed prices, cattle values and margins, it is obvious that some years were much more favorable than others. Yet there was no year when the feeding of farm grown feeds for finishing feeder cattle did not give as great a return as if they had been sold at prevailing market prices. The lowest returns secured was in 1928-29. For every dollar's worth of feed fed that winter, it was marketed through steers at \$1.02. The season of 1921-22 was the most favorable one, from the point of view of the cattle feeder. Every dollar's worth of feed consumed by four cars of steers in the feed lots that year returned \$3.05.

The figures mentioned above cover feed only. No allowance has been made for grinding the grain, straw, labor, cost of buildings and other overhead expenses necessary for carrying on cattle feeding. Interest at the rate of eight per cent., however, was charged on the money invested in cattle during the feeding period.

An analysis of the figures covering the ten-year period in question, therefore, would offer some encouragement to the man who is considering the advisability of marketing at least a portion of this year's crop by the cattle finishing route.

FACTORS TO BE CONSIDERED BEFORE FEEDING IS UNDERTAKEN.

The man who contemplates finishing cattle for the first time should not enter into the undertaking without first considering whether or not he has a sufficient and suitable shelter, and whether or not he has, in a certain measure at least, the natural aptitude for cattle feeding.

It is important to have sufficient suitable feed on hand in the fall to carry the number of cattle which are likely to be

fed through the winter feeding period. It is a common failing of many farmers to overestimate the tonnage of feed in the fall, and to find that along about February or March, additional grain and roughages must be purchased, and often hauled a considerable distance. It is better to underestimate than overestimate the feed supply and to slightly understock than overstock with cattle for feeding. In considering the matter of feed supply, it is well to keep in mind that not all kinds of rough feed can be profitably marketed by finishing animals in the feed lot. The feeding of cattle on low grade and damaged roughages has been practised by some, and while satisfactory results have been obtained in a few cases, the gains have usually been unsatisfactory, and the finish obtained has not been sufficient to enable the cattle to return a fair profit on the grain fed. While a limited amount of inferior roughages can be utilized, it is wise to include in the ration a fairly liberal allowance of some of the palatable and nutritious hays or silages.

An available supply of good water is a point which cannot be overlooked by the feeder, and in some areas may be a limiting factor as to the number who can engage in this enterprise. It is important to have water close at hand where the animals may drink at least once per day. The ideal condition would be where water is so located in relation to the feeding ground that it would be accessible at all times. A good well located close to the feed lot is undoubtedly the most reliable and satisfactory source of water supply, but sloughs, springs, and sometimes streams, can often be utilized to good advantage. In case the animals are watered from a trough, it may be necessary to use a water heater in order to prevent freezing.

In addition to considering the feed and water supplies, the prospective feeder should turn over in his mind the matter of suitable shelter for his cattle. If natural shelter in the form of willow or poplar bluffs, or deep ravines, is not to be had, he should be prepared to erect some form of cheap shelter, for while it is true for the most part that Alberta's winter climate is favorable for cattle feeding, protection from prevailing winds is taken for granted as necessary with almost any class of stock. A straw shed has been used at the University for a number of years as a steer shelter, and has given good satisfaction. This shed was made of poplar poles and straw with walls two feet thick, and the roof covered to a depth of two and one-half feet. Where poplar poles are not available

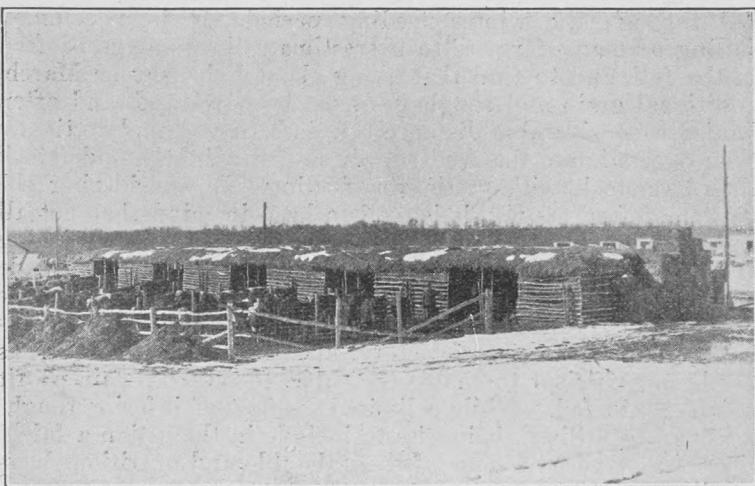


Plate I.—Straw shed in use at the University of Alberta as a winter shelter for steers.

in sufficient quantities, woven wire could be used as a medium for retaining the straw in the walls. The shed referred to was 140 feet long, 26 feet wide and 8 feet high, partially open to the south, and with a six-foot feed alley running full length of the shed. The steers were fed inside the shed in a feed box twenty-four inches wide and twelve inches deep, arranged along this feed alley. This shed was divided into seven pens, 20 feet by 18 feet in size, each of which accommodate eight to ten two-year-old steers. A larger number of younger animals might be quartered in this space. Attached to each pen was a yard, 40 feet in depth.

Single ply board sheds, partially open to the south, have been found satisfactory by many feeders. These may be built of any dimensions to suit the number of animals to be fed. The cattle need not necessarily be fed in these sheds, as the practice followed by many men, that of feeding from bunks outside, can be recommended. A tight board fence from six to seven feet in height has been used by some as a shelter, and has furnished the necessary protection. Feed racks and bunks arranged close to this type of shelter obviates the possibility of discomfort during windy spells.

A point which is worthy of mention in connection with shelters for cattle is the matter of bedding. The extent to

which cattle will be comfortable during cold weather, and respond to generous feeding, depends, to a considerable measure, upon the amount of bedding which they are allowed. A dry, comfortable bed is very important in connection with cattle management. The frozen lumps of manure should be removed frequently, and the supply of bedding renewed if the best results are to be expected.

It has been mentioned that one's ability to feed is a factor which should be considered before cattle feeding is undertaken. In this connection such a question as the following might be raised: "I find myself with an abundance of good feed on hand, other conditions on my farm are ideal for cattle feeding, and I can purchase a bunch of good feeders from a farmer nearby. Would I be well advised to buy these cattle, and do you think I would make a success of the undertaking?" Off-hand, the proper answer to this question would seem to be: "By all means buy these cattle. There seems to be no real obstacle in the way of your making a success of your feeding project." It must be borne in mind, however, that where one man might make good under this set of conditions another might fail miserably. The difference would lie in the one man having what might be called the "feeder's eye," and the other not possessing it and feeding in a purely mechanical way. There is an old adage which might well be quoted here, namely, "the eye of the master fattens his cattle." The feeding of certain quantities and kinds of feeds at definite intervals is not enough in the feeding of any class of stock. The successful feeder must be blest with a natural ability to study the animals under his care, to understand the requirements of each, and to modify the system of feeding with the different conditions that arise from time to time. The man who plans to feed by following certain definite rules, and who is not prepared to give time to a study of his animals, and to cater to the individual needs, might be better advised to leave cattle feeding alone, and market his feed in some other way. On the other hand, the man who feels capable of developing the "feeder's eye" even though he has not had experience in feeding, should be in a position to make a reasonable success of the venture.

There is still, of course, the important question of business management to be considered. One may have the ability to feed and care for the animals and still not secure the maximum returns possible for his efforts. The difference per pound

between the purchase price and selling price of the steers, known as "margin," is one of the big factors determining the profit in the business. The possession of knowledge which will serve as a guide as to when to buy on a favorable market, and when and where to sell to best advantage, is necessary if one expects to be successful. This is one important reason why money has been made by speculators engaged in the business of cattle feeding. They are close students of market conditions, and their ability to show a profit has been due in as large a measure to the taking advantage of favorable markets as to any ability they might claim as good feeders. While it is not expected that farmers should be as familiar with the buying and selling of cattle as those directly connected with the business, it should be pointed out that a knowledge of buying of feeders and selling of finished cattle, along with the ability to feed and care for the animals in the feed lot is essential for greatest returns in the enterprise.

FACTS TO CONSIDER IN PURCHASE OF FEEDERS.

Type: The question of the type to buy is one that is closely linked up with success in cattle finishing. Those animals showing a predominance of the blood of one of the beef breeds, low-set and compact in form, fairly smooth, broad short heads, straight lines, with mellow skin and abundance of good quality hair, furnish the type that will usually feed out the most satisfactorily and will be the kind that when finished should be in demand. It is true that there are times when cheaper, plainer animals may show as much or even greater profit. This is due to the fact that they can be bought much cheaper and if the difference in price between good and common cattle is very much in favor of the cheaper kind, one might be justified in selecting the latter. At the same time, the feeder who handles reasonably good quality cattle will not only get considerably more satisfaction in looking after them, but as a rule, they will, if properly finished, sell to better advantage. Polled or dehorned animals have a big advantage over horned cattle when it comes to feeding loose in groups. Horns are a common source of restlessness in cattle and their possession is responsible for fighting and general disturbance in the feed lot. Cattle without horns will reach the market in much better condition than horned animals, and for that reason will sell for a better price. In case the horns have not been re-

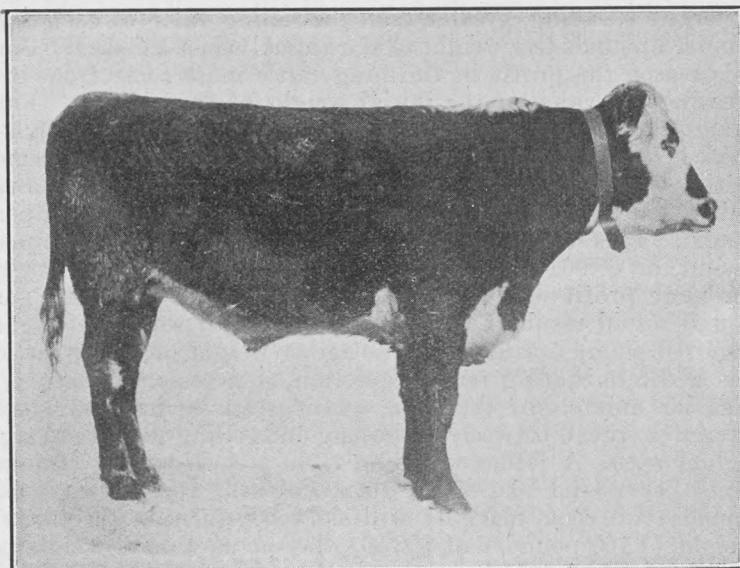


Plate II.—A good type of feeder steer, showing beef form, constitution and feeding capacity and evidence of good breeding.

moved, this should be done before they are put into winter feeding quarters.

Age: In connection with the age of cattle, there are some factors to keep in mind. Trials conducted at this station as well as at other places, show that, other things being equal, calves will make the cheapest gains; at the same time, they do not make as rapid gains as older cattle. In addition, immature feeders, in order to attain the proper finish, require a longer feeding period than do the older animals, which means they are seldom ready for market before the rush of spring seeding commences, a consideration worth keeping in mind. Yearlings, while not making quite as economical gains as calves, take on weight more rapidly and finish in a shorter feeding period. Two-year-olds make the most rapid gains as compared with both calves and yearlings, require a somewhat shorter feeding period, but require more feed to produce one hundred pounds of gain.

The question of the spread or margin necessary to make cattle feeding profitable is of considerable importance. The actual feed cost of putting on one hundred pounds of gain is,

generally speaking, greater than the selling value of each one hundred pounds live weight of the animal when finished. For this reason the profit in finishing cattle must come from increasing the value of the initial weight of the animals. For example, a feeder weighing eight hundred pounds is purchased for five cents per pound. When finished this same initial weight of eight hundred pounds (together with any gains made during the feeding period) is worth six cents per pound. This means an increase or "margin" of one cent per pound, or \$8.00. It is obvious that the greater the margin the more profit will be secured. A margin of two cents per pound would result in a profit on the initial weight of eight hundred pounds, or \$16.00. The age or weight of feeder cattle has a direct bearing on the question of necessary "margin." Heavier animals of the same quality can be handled on a narrower spread between the buying and selling price than can lighter ones. A feeder weighing 1,100 pounds bought at four cents per pound and sold, when finished, at six cents per pound (two cents margin) will show a return on the initial weight (1,100 pounds) of \$22.00, whereas an animal weighing five hundred pounds, bought and sold on the same basis, would only show an income on the initial weight of \$10.00—a difference of \$12.00 in favor of the heavier animal. Keeping this fact in mind the younger, lighter cattle, while showing an advantage in economy of gains as compared to the older, heavier animals must, in order to show the same profit, be either bought somewhat cheaper or sold at a higher price per pound. In other words, they cannot be handled on as narrow a margin as the older, heavier cattle.

Other things being equal, one is safe in making the statement that for the inexperienced feeder, the older cattle have some advantages. For example, the more mature animals are less likely to go off feed, are as a rule capable of handling probably more roughage, as well as feed of a lower grade and quality, and they will withstand the rigors of a cold winter better than the younger animals.

On the other hand, one must keep in mind market requirements, and in this connection there is no question that the present day demand in beef is for the lighter weight. This is one of the disadvantages in feeding the older, heavier cattle. Considering the question of the most desirable age from every angle, it would appear that for the man who has had little previous experience in finishing cattle the choice

would be yearlings, that is, animals that would be finished in the spring when they are two years of age, at which time they should weigh approximately 1,000 pounds.

The relative price of feeder cattle of different ages will naturally influence one in buying. The above facts in connection with the advantages and disadvantages of animals of various ages and weights should, however, be kept in mind.

Sex: One of the disadvantages in purchasing unspayed heifers, is the fact that a certain percentage are likely to be in calf; this, however, would not apply to the same extent in the case of heifer calves. In one trial conducted at the University of Alberta in the winter of 1927-28, when one lot of nine yearling heifers was compared with a similar group of yearling steers, seven of the heifers (or over 75%) proved to be in calf. The carcasses of these were subjected to a low grade, namely "A-1 cows," which meant a relatively low value as compared with the remaining two that graded "A-1 heifers." In a second trial when eight heifers were fed, only two (25%) were pregnant. In the case of non-pregnant heifers, the fact that they are "in season" regularly means that there is a tendency for lower gains during these periods of disturbances, which would naturally increase the cost of putting on one hundred pounds of gain. Experience has shown that, other things being equal, steers will make somewhat higher gains than heifers. There may be exceptions, but as a rule this statement will hold. Heifers, on the other hand, are inclined to finish somewhat earlier, which means a shorter feeding period. Speaking generally, feeder heifers can usually be purchased for less than steers of the same quality. The exception would be during periods of a strong demand for breeding females which occur at times. It is a fact too, that well finished heifers, not in calf, will sometimes sell for about as much per hundred pounds as steers of equal weight, quality and finish. Based on the average of the two experiments reported from this institution, feeder heifers would necessarily have to show a margin of from thirty-five to forty-five cents per hundred pounds more than steers in order to compete profitably with them. In these trials the actual margin secured from heifers was 71 cents per hundred pounds more than for steers, thereby resulting in a greater profit in the case of heifers.

Where to Buy: In the purchase of feeder cattle, there are two sources of supply: the larger central stock markets, and the rancher or farmer.

In some districts it is possible to buy direct from farmers or cattlemen not too far removed from one's farm. There is some advantage in this. The cost of transportation, yardage, and commission charges for buying are eliminated, there is less loss in shrinkage from shipment and the animals get very little, if any, set-back in becoming adjusted to a new environment. At times, however, the price paid for such feeders is quite as high as when bought on public stock yards, and one is sometimes obliged to take at least some undesirable animals. When bought on the public stock yards, a much better choice in respect to uniformity, age, color and type is possible.

When it is planned to feed one or more cars of cattle, and they cannot be bought to advantage near home, the larger central yards will be found a very satisfactory place to buy. Not only is it possible to get a better selection, but in addition the services of the Dominion Livestock Representative at the market, as well as of the livestock commission firms, are available when buying at public stock yards. The Live Stock Branch officers located at Calgary and Edmonton yards are always at the disposal of any farmer or individual who is looking for information or assistance in purchasing feeder cattle.

In addition to this service, buyers of feeder cattle on public stockyards are entitled to a reduction in freight from the yards to their nearest railway point, and also of travelling expenses in the actual purchase of steers. Any farmer who wishes to purchase a carload or more of stock for feeding purposes can go to the yards, or in the case of a group of farmers who wish to buy a carload or more co-operatively, they may send a representative to the yards to do the buying. If the Livestock Branch officers are satisfied that the shipment is for bona-fide feeding purposes, they will issue a railway certificate which automatically entitles the particular shipment to a reduction at the present time of approximately seventyfive per cent. in the freight rate from the stock yards to his nearest railway station. Besides this, the Dominion Livestock Branch will also pay the railway fare of the buyer from his nearest railway station to the stock yards, also room and board during the actual time of purchasing, subject to the approval of the Livestock Branch representative. Those wishing to avail themselves of the service as outlined should get in touch with the Dominion Government Market Representative at the Edmonton or Calgary Stock Yards.

When to Buy.

The most favorable time to buy feeders depends upon market prices and local conditions. The market price for feeders is governed very largely by the supply and demand. Frequently during certain weeks in the fall there are heavy runs of cattle, and at such times the price usually drops. If one can arrange to make his purchase of cattle at such a time, it may mean the difference of one-quarter to one-half cent per pound. This is one advantage of buying through someone on the yards who is in close touch with market conditions. During the late summer and early fall, before the rush of feeders commences coming to the market, the price is sometimes higher than it is later. It is difficult, however, to state definitely when one might buy to best advantage, so far as market conditions are concerned. It has already been stated that the ability to buy on a low market and to sell when prices have reached their peak is a big factor in making money in cattle finishing. About the only suggestion that can be made in this connection is to follow market conditions as closely as possible, and to buy when it seems opportune.

Conditions on one's farm will influence to quite an extent the best time to purchase feeders. Where one has considerable pasture available, it is sometimes an advantage, provided market conditions are favorable, to buy during the summer or early fall and before there is a brisk demand from others who are planning to buy later in the season. On the other hand, when plenty of pasture and water are not available, where fences are not secure, and on farms where the rush of harvest makes it inconvenient to look after the cattle, it is better to leave the purchasing of feeders until after the crop has been harvested. At such time one is in a better position to estimate accurately the amount of feed on hand, and more time can be taken in buying which usually results in a more satisfactory purchase. Obviously, the length of time the cattle should be on feed in order to finish properly would have a direct bearing on the time to purchase. Calves, that ordinarily require six to seven months to finish, should be on feed reasonably early in the fall, whereas with older, fleshier cattle, that would be ready for market in two to four months, the purchase might be delayed somewhat longer.

Cost of Purchasing.

In case one wishes to buy directly through one of the commission firms, the charge is \$17.00 per car for buying at

both Edmonton and Calgary. Being located at the yards, and in close touch with market conditions, the commission firms are, as a rule, in a position to buy advantageously.

The farmer who purchases feeders in car lots or more at the Calgary and Edmonton yards for shipment to country points can figure on the following items of expense:

1. Cost of purchasing animals, \$17.00 per car—collected by Commission Company.
2. Cleaning car, 75c—collected by Railway Company.
3. Brand inspection, 10c per head—collected by Provincial Government.
4. Loading, \$1.00 per car—collected by Stock Yards Company.
5. Straw for bedding, approx., \$2.00 per car—collected by Stock Yards Company.
6. Transportation of animals from stockyards to nearest railway station.

By taking advantage of the "Joint Freight Policy" at present in effect, the purchaser need pay only twenty-five per cent. of the regular freight rate.

At present there is a condemnation insurance on all cattle sold on the yards of one-half of one per cent. on the value of the animals. This amount is deducted from the owner of the cattle and credited to the purchaser to compensate him against any loss that might occur due to diseased animals.

Length of Feeding Period.

The length of time required to change an animal from the feeder class to a good butcher class depends upon the age, type, quality and degree of fatness of the feeder, as well as upon the ration fed. In the winter of 1922 six out of eight two-year-old feeder steers of good type, quality and fleshing fed at this Station would have topped the market seventy-five days after being placed on a full feed of oat hay, sunflower silage and grain. None of the common to fair feeder steers of the poorer type, quality and fleshing were finished in seventy-five days, but six out of eight were finished in one hundred and five days on the same feed. In the winter of 1923 and 1924, calves and yearlings were fed. Combining the two years none of the calves had sufficient finish to sell for the top price at the end of one hundred and forty days on a full feed of hay, silage and grain. In the yearling steer groups, none were finished at the end of a one hundred and five day feeding period, but nineteen out of twenty-four steers would have been classed as good butcher steers at the end of the one

hundred and forty day feeding period. Cattle on full feed usually require the following length of feeding period:

Two-year-olds	75 to 120 days
Yearlings	120 to 160 days
Calves	150 to 200 days

Suitable Feeds for Fattening.

Every good feeder realizes that variety in the ration for any animal is important. For this reason the greater choice of feed one has available the greater is the chance of success in cattle finishing provided a judicious use is made of such feeds. One fact should be kept in mind, however: the object of feeding cattle should be to utilize home-grown feeds rather than purchased, and the aim should be to make as much use as possible of the feeds one has available. In the irrigated district where alfalfa is to be had, it is one of the best roughages. In Central and Northern Alberta green feed and prairie hay are the "stand-bys." Any one of these roughages will be satisfactory, or if it is possible to combine two of these roughages, so much the better. Silage has given most excellent results in steer feeding at the University of Alberta, and when a supply is available it materially helps out the other feeds.



Plate III.—A large percentage of the coarse feeds produced on the farms in Alberta can be profitably marketed by means of steer feeding.

When only dry roughage (alfalfa, oat hay, or prairie hay) is being fed, it is good policy to feed all that will be consumed without undue waste, particularly during the first two or three months of the feeding period. Two-year-old steers will consume from sixteen to twenty pounds of such feed per day. Where silage is being fed, the amount given will be governed largely by the supply on hand. They will consume as high as thirty-five pounds per day together with three to six pounds of hay. For most economical results, however, a feed of around fifteen to twenty pounds per day of silage, together with all the dry hay the cattle will clean up will be found satisfactory. As the feeding period advances it is sometimes an advantage to restrict the amount of roughage in order to increase the consumption of grain. This is advisable when the animals are not gaining as rapidly as may be desired, so in order to hasten gains a heavier feed of grain is necessary. Heavy grain feeding (up to eighteen or twenty pounds per day) is possible only when the volume of roughage is decreased, and then only in case of older animals.

Barley is one of the best fattening feeds available in Alberta. The addition of oats will make it more palatable and lighten it up somewhat. During the early stages of the feeding period a mixture of equal parts of barley and oats is satisfactory. After the cattle have been on feed for one or two months, depending upon the condition of the animals, this mixture may be gradually changed to at least two parts of barley and one part of oats. Wheat even of a low grade, or a good grade of wheat screenings where available, may be used to good advantage as a substitute for barley, although not quite as satisfactory a grain for finishing as barley. Both wheat and recleaned standard screenings will give better results when mixed with oats. All grains should be ground.

A discussion of suitable feeds for finishing cattle would not be complete without reference to protein supplements. With the exception of legume hays (alfalfa, sweet clover, etc.), the ordinary Alberta farm grown feeds can be classed as carbonaceous, rather than protein or nitrogenous. Linseed oil meal, a by-product of linseed oil manufactured from flax seed, is recognized as the most important protein supplement for cattle feeding in Alberta. In case legume hay, to any considerable extent, is available for feeding, the matter of protein in the ration for finishing cattle need cause no concern. When no legume hay is available, the feeding of linseed oil meal, especially in the case of younger animals, may result in

more economical gains together with an increase in the selling value of the finished product. There is not the same need for protein supplement where yearlings and two-year-old animals are being fed.

The question of whether or not the feeding of linseed oil meal would be justified depends on the price of this particular product in relation to the value of coarse grains. Based on several trials at the University of Alberta the statement may be made that when the range in prices of grain is from one-half to one and one-half cents per pound, linseed oil meal had a feeding value for yearling steers of from \$56.00 to \$62.50 per ton. The value of linseed oil meal would be somewhat greater in the case of younger animals, calves for example. On the other hand, as has been already pointed out, two-year-old cattle would not show such good results from feeding this protein supplement. While it is true that the primary object in finishing cattle is to market home-grown feeds, at the same time if one can find a market for a portion of such feeds at a price that will justify the purchasing of linseed oil meal it is obvious that it would be good business to include the latter feed in the ration.

Under ordinary conditions a mixture of one-half pound per head daily of linseed oil meal, mixed with the grain ration, would be about all one would be justified in feeding. One-quarter pound per day to each animal would be sufficient on the start with a gradual increase until the full amount of half a pound per head per day was reached. In case the amount of linseed oil meal is limited, it might be advisable to delay the feeding of it until the animals were on feed two months or more. There is not the same need for linseed oil meal where silage is included in the ration. Some of the advantages of feeding linseed oil meal is that it tones up the digestive system and also has a tendency to improve the bloom and general appearance of the animals. The succulent nature of silage has somewhat the same effect.

By-products of sugar manufacture—beet pulp and crude molasses, where available, as they are in certain sections of Southern Alberta—can be utilized to good advantage for finishing in the feed lot, provided they are judiciously used. Within the past few years an important industry in finishing native cattle has developed in the vicinity of Raymond, based largely on the by-products of the sugar beet factory.

Amount of Grain to Feed at Various Stages.

This will depend on such factors as the condition of the steers, the length of the feeding period and the relative price of grain and hay. With animals that are only in very moderate condition of flesh when put on feed and when the feeding period is less than one hundred and twenty-five days to one hundred and forty days, the aim should be to get them on a reasonably heavy grain ration without too much delay. At the start two or three pounds of grain per head daily would be about all they could take to advantage. This amount should be gradually increased at the rate of one pound per week until the steers are getting six to seven pounds per head daily at the end of the first month. From this time on the amount of grain to be fed will be determined by the progress made by the steers, and the relative price of grain and roughage.

Two-year-old steers, full fed at the University of Alberta, have consumed as high as fifteen pounds of grain per day, while getting a full feed of roughage. Yearlings under the same conditions were taking up to ten pounds of grain, and calves not more than eight pounds per day of grain. In years of low or medium priced grain, such as prevail at present, it would suggest the advisability of feeding a full feed of grain. On the other hand, when grain prices are relatively high, as compared to hay, more economical gains will be made by feeding a limited amount of grain. While the gains will naturally be slower, the steers will consume more of the cheaper roughages. Beginning with the second month, the grain ration should be gradually increased until at the beginning of the third month they would be on full allowance, which would be continued until they are marketed.

There may be exceptional cases where the grain ration would be increased above that mentioned. Some very successful feeders have fed as high as twenty pounds of grain per day. In such cases it is necessary to limit the amount of roughage in order to get the animals to consume this amount. This, however, can only be recommended when grain is comparatively low in price, or when the feeders are of particularly good quality and the aim is to put on a high degree of finish, or when the feeder desires to sell on an early market.

No more grain should be given than the animals will clean up, as it is an easy matter to put them off their feed, and once they receive a setback, considerable valuable time is lost before they completely recover.

Under ordinary conditions, twice a day feeding is sufficient. A good system is to feed the grain first in the morning and follow with hay, the same order to be followed for the evening feed. When silage is being fed, good results will be obtained by feeding the grain with silage, and whatever hay is fed may be offered afterwards.

Self Feeding Grain.

Based on trials conducted at the University of Alberta within the past few years when calves were self fed grain, it would appear that, provided certain precautions are taken, this method will give satisfactory results. Cattle self fed grain will consume a larger amount than when full hand fed. Calves, during the last month of the finishing period, consumed as high as an average of fourteen pounds of grain per head daily, as compared with a similar group full hand fed, whose average daily consumption did not exceed ten pounds. Care must be taken in connection with getting the cattle on full feed. The practice followed at this institution, and one that has worked out satisfactorily, is to start the animals on a feed of two to three pounds of whole oats per head daily, and rapidly increase the amount until at the end of two or three weeks they are on a full feed, as evidenced by the fact that they are leaving grain in the feed bunks. Following this, the self feeder is brought into use. At the commencement of the second month the ration (still self fed) is changed to coarsely ground oats, two parts, and ground barley, one part. The feed consumed the third month was again changed to equal parts ground oats and barley, and this mixture was continued throughout the feeding period.

Very little trouble was experienced with digestive disturbances. A few of the animals bloated at times, but this occurred when they were watered only once each day, at which time, and especially during the warm spring weather, in March and April, they consumed very large quantities of water. When a change was made to watering twice daily, there was practically no further trouble with bloating.

Cattle feeders have reported that the self feeding of grain to cattle has resulted in some losses due to the animals gorging themselves. This suggests that where such a method is to be practised, there is need for special care and judgment in getting the cattle on full feed, attention to the question of watering, as well as the quality and kind of grain used. On the other hand, the advantage to be gained in economy of labor,

especially when cattle are being fed in relatively large numbers, together with the more rapid gains secured, and in a season such as the present of low grain prices, the greater consumption of grain would all be arguments in favor of self feeding.

Regularity in feeding is essential for best results. Salt should be available at all times, either in block or granular form.

Gains to be Expected.

The rate of gains made by animals in the feed lot depends upon several things. The amount and kind of feed naturally is an important one, but as this question has already been discussed in sufficient detail, it is not necessary to elaborate

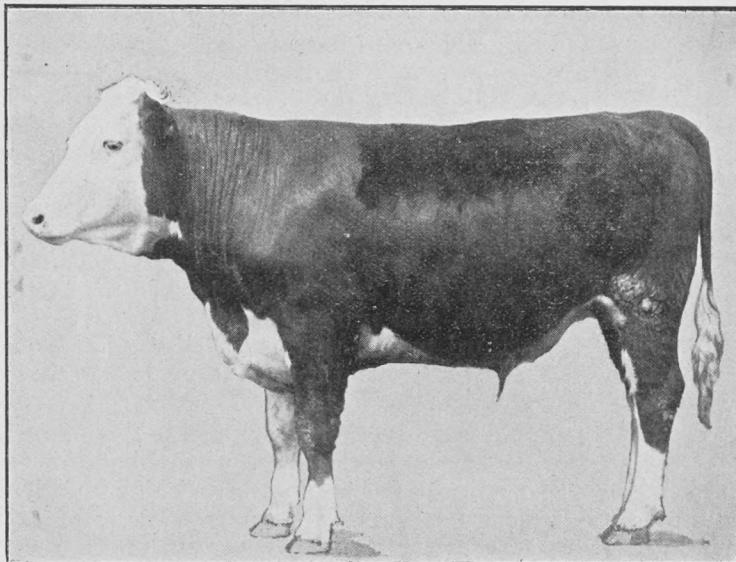


Plate IV.—Finished at two years of age, at the University of Alberta, in the spring of 1928, a group of ten steers, of which this is a representative, made an average daily gain of 2.11 pounds during a 137 day feeding period. Farm grown feeds were marketed through these steers at the following prices:

Oat Hay	\$10.00 per ton.
Oats	77c per bushel.
Barley	\$1.08 $\frac{1}{2}$ per bushel.

In the above calculations, no allowance was made for labor and straw.

further. This is particularly true, because after all, the feed that will be fed on any farm is dependent to a large extent on what is available.

The other factors that have a direct relationship to the gains that may be looked for may be mentioned as follows:

The type of animal greatly affects the rapidity of gain. Cattle of the type mentioned under "Purchase of Feeders" (page 10), will usually make more rapid gains than those showing poor breeding, lacking in depth, breadth, constitution, quality and feeding capacity. Inferior cattle cannot be expected to make as rapid gains as the better ones.

As has already been mentioned, the older heavier animals have an advantage when it comes to the question of rapidity of gains. The average of three years' trials conducted at the University of Alberta on which the gains on calves, yearlings and two-year-old steers of good quality and breeding were compared, gave the following results:

	Average Daily Gains
Calves	1.78 pounds
Yearlings	2.17 pounds
Two-year-olds	2.30 pounds

Animals that are in a thin condition of flesh gain more rapidly than those of better finish on the same feed. The average daily gains made by cattle on the same ration will therefore gradually decrease as they develop a higher degree of finish. The following table shows the average daily gains made by two groups of steers during consecutive thirty-day periods:

		Medium
	Thin Steers	Fleshed Steers
Oat Hay		
Sunflower		
Silage, Grain		Same Ration
First 40 days.....pounds	4.359	4.370
Next 30 days	"	2.938
Next 30 days	"	2.563
Next 30 days	"	1.690
Average during trial	2.952	2.741

It will be noted in the above table that there are particularly high gains indicated during the first forty days. This is largely due to fill. The steers were secured on the Edmonton market. They probably had suffered a shrink and lack of feed from the time they were shipped to the stock yards to the time they arrived at the University. Steers taken off good

pasture and placed immediately in feed lots will not show such heavy gains during the first period.

Animals given good shelter, plenty of bedding, fed and watered regularly, and not allowed too much range, will make more rapid gains than those improperly cared for. Proper treatment is an essential factor in making cattle feeding a profitable undertaking.

Feed Requirements to Produce 100 Pounds Gain.

In a discussion of this problem of cattle finishing, the question of feed again must receive attention. Both roughages and grains vary a good deal in their nutritive content as well as in their ability to stimulate gains. Nutritious feeds will produce one hundred pounds gain with less feed than those containing less nourishment. From the experiments conducted at the University of Alberta, comparing different roughages, it was found that sixty pounds less hay but sixteen pounds more grain was required to produce each hundred pounds gain, when alfalfa was fed, than when oat hay was fed as the roughage. When oat hay was compared with prairie hay, it was found that thirty-five pounds more hay but one hundred and fifty-five pounds less grain was required to produce each hundred pounds gain than when prairie hay was fed. Which roughage should be fed depends upon the availability and the relative price of each.

The addition of a succulent feed to a ration in the form of silage reduces the feed requirement. Based on three years' trials each ton of silage fed effected a saving of approximately 1,200 pounds of hay and 70 pounds of grain.

There are other factors besides the ration which affect the feed required to produce one hundred pounds of gain. In this connection the age of the animal is to be considered. It has already been pointed out that, other things being equal, the younger, lighter weight animals will require less feed to make one hundred pounds gain than will older, more mature cattle. Thin feeders will require less feed per one hundred pounds of gain than will higher fleshed animals of similar weight and quality. As the feeding period advances and the fattening process goes on, the feed requirements increase. In one experiment conducted at this station in which a comparison was made in the feed requirements for one hundred pounds gain, between thin and medium fleshed steers, the results showed that there was a difference of forty-two pounds of

hay, one hundred and twenty-eight pounds of silage, and thirty-four pounds of grain for each hundred pound gain, in favor of the thin steers. Thin cattle put on a larger proportion of lean meat than do fat animals. Most feeders are thin because they have not previously received sufficient feed to develop a normal covering of flesh. Therefore, when a thin animal is fed heavily a larger proportion of feed will be converted into muscle or flesh tissue than when an animal with normal fleshing is fed. Since lean meat can be manufactured out of less feed than fatty tissues, a thin beast will be able to put on one hundred pounds of weight with less feed.

Cost of Marketing.

The various charges in connection with marketing on the Edmonton and Calgary Yards, to be paid by the seller, are as follows:

- (a) *Transportation* from the nearest railway station to point where the cattle are marketed. This will, of course, depend upon the distance. The local railway agent would be able to give the shipper this information. Under certain conditions, it is possible to take advantage of through billing privilege which reduces the cost of transportation from the feed lot to the market. The Market Representative on any of the yards, or any commission firm, will be in a position to advise how cattle should be billed in order that this privilege may be secured.
- (b) *Cleaning car*: 75c. This charge is assessed by the Railway company.
- (c) *Yardage charges*: 35c per head for cattle, 20c per head for calves under 400 pounds. This charge is collected by the Stock Yards Company, and includes the privilege of the market, use of the yards, attendance, weighing, and water.
- (d) *Unloading*: \$1.00 per car, charged by the Stock Yards Company.
- (e) *Brand Inspection*: 10c per head. This charge is assessed by the Provincial Government.
- (f) *Fire Insurance*: 15c per car load. The Stock Yards Company insures the livestock against fire as long as they remain in the yard.
- (g) *Feed*: From the time the cattle arrive until sold. All feed fed in the yards must be purchased from the Stock

Yards Company. The price of feed varies from time to time. The amount of feed used will depend on the length of time the cattle are maintained at the yards before selling. For a car of cattle sold on an active market, it would run approximately five hundred pounds of hay.

- (h) *Commission charges*: \$17.00 per carload, 90c per head for less than carload lots. This charge applies when cattle are sold (as they usually are) through one of the livestock commission firms operating on the stock yards. This applies to both the Calgary and Edmonton yards.
- (i) *Condemnation insurance*: One-half of one per cent. of the value of the animals.

All cattle are sold on fed and watered weights—not being offered for sale or weighed until they have rested and fed.

A summary of the cost of marketing a carload of cattle would be about as follows:

Transportation from farm to stock yards (to be calculated)	
Cleaning car	\$.75
Yardage on 20 cattle	7.00
Unloading, per car	1.00
Brand inspection	2.00
Fire insurance15
Feed, approximately	5.00
Commission charges	17.00
Condemnation insurance, one-half of one per cent. of the value of the cattle (to be calculated)	

In addition to the various items mentioned in connection with the cost of marketing, there is the matter of shrink in the cattle that has to be accounted for. The amount of shrink will depend on the distance the animals are shipped; the kind of weather at the time of shipment; the ration fed particularly just previous to loading; the condition of the cattle, and the temperament of the various individuals.

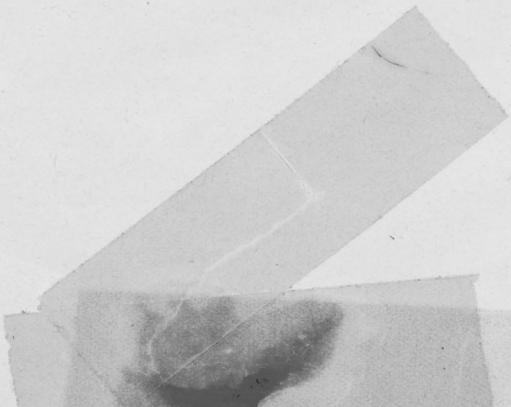
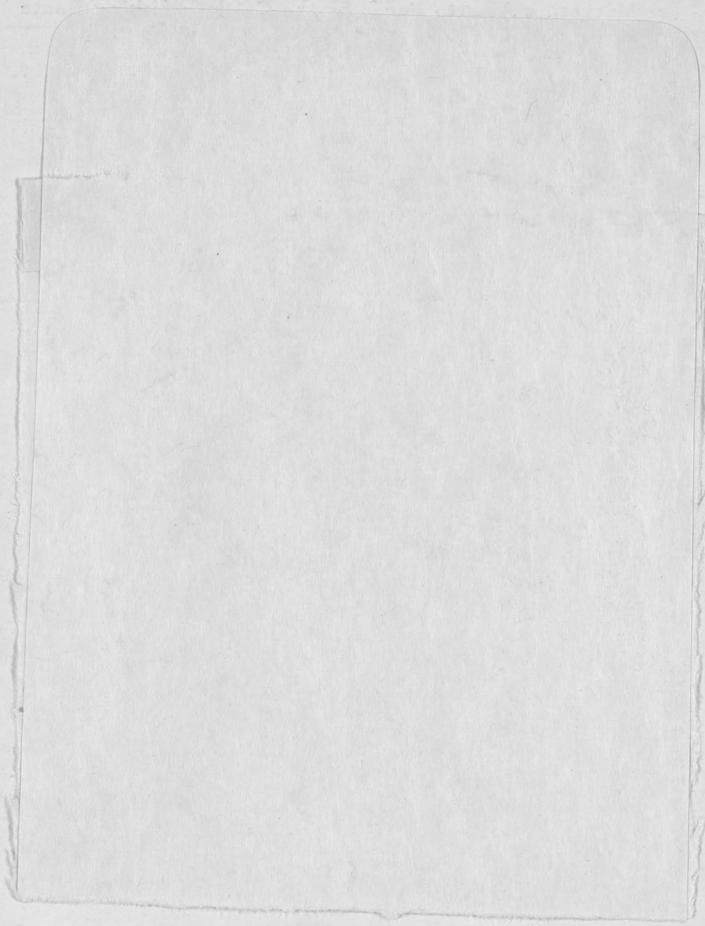
During the past few years the total charges, including shrink in shipping steers from the University farm to the Edmonton Stock Yards have been approximately forty cents per hundred pounds. From the time the steers left the farm until they were unloaded and weighed at the stock yards, between seven and eight hours had elapsed.

SUGGESTIONS FOR PREPARING CATTLE FOR SHIPMENT.

The amount of shrinkage in shipping cattle to market can be controlled to a certain extent by proper feeding and handling a day or two before loading.

The following suggestions are offered with a view of reducing shrink in transit:

1. When on heavy grain feed, reduce the amount of grain by one-third at least, a day previous to loading.
2. When silage is being fed, reduce the amount to at least one-half, two days previous to shipping.
3. Feed more dry roughage (such as prairie hay or timothy hay) one or more days before shipping to make up for the reduction in grain or silage.
4. Do not allow too much water just previous to loading.
5. Avoid getting cattle excited or overheated from the time they leave the farm until loaded in cars.
6. Do not overload cars, but at the same time load to capacity.
7. Bed cars well with straw in cold weather. In warm weather bed with an inch or two of sand dampened with water.



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